

**Cumulative indexes for Acorn User numbers 1 to 12 (July/August 1982 to July 1983)**

**Compiled by Paul Nash**

**Note: There are separate indexes for Article Subjects, Programs, Reviews, and Competitions; each index entry refers to issue number (in *italics*), then page number(s)**

**ARTICLE SUBJECTS**

acoustic couplers 3, 21  
addressing modes 7, 14  
aliens 1, 27  
amplitude envelopes 2, 34; 5, 61; 8, 23-4; 10, 62  
analogue-to-digital conversion 1, 35; 2, 52-3; 5, 5; 10, 53-4; 11, 67, 69  
art 2, 27-9; 5, 76; 7, 3  
artificial intelligence 8, 75  
ASCII codes 1, 27; 4, 14; 5, 55  
assembly language 4, 12-14, 78; 5, 11-12, 14; 6, 11, 13-14, 16; 7, 11, 14-16; 8, 41-3; 9, 35-8  
also see machine code  
Atom using BBC Basic 2, 38, 61; 6, 51; 7, 43-4, 46; 8, 71-2  
audio output 7, 60; 10, 90  
authors of articles  
(David) Allen 1, 10; 2, 10; 3, 11; 4, 10; 5, 8-9; 8, 8  
(Tony) Armistead 7, 47  
(Charles) Bake 7, 29-30  
(Peter) Balch 9, 12  
(David) Ball 12, 51  
(Matthew) Bates 3, 36; 5, 46  
(Paul) Beverley 2, 59; 3, 41; 4, 51, 58; 5, 32; 7, 37; 8, 67; 9, 62; 10, 11, 53; 11, 65, 90; 12, 61  
(Ian) Birnbaum 3, 24; 4, 16; 5, 16; 6, 25; 7, 25; 8, 15; 9, 42; 10, 42; 11, 41; 12, 47  
(Ian) Carpenter 2, 52  
(Paul) Carpenter 2, 44  
(J.) Charlton 6, 54  
(P.) Chilvers 12, 47  
(Mike) Coleman 7, 24  
(John) Coll 1, 32; 3, 20  
(Ian) Copestake 9, 42; 10, 90; 12, 39  
(M.) Cozens 10, 43  
(Andrew) Cryer 3, 16; 5, 53  
(Simon) Dally 1, 19; 2, 56; 3, 49; 4, 68; 6, 46; 7, 54; 8, 75; 9, 75; 10, 75, 78  
(E.) Denis 10, 43  
(J.) Doggett 12, 51  
(David) Duff 1, 35  
(Tim) Edwards 6, 37  
(Heinz) Eipel 9, 11  
(Peter) Fenwick 1, 36  
(John) Ferguson 1, 16; 2, 49; 4, 12; 5, 11; 6, 11; 7, 11; 8, 41; 9, 35, 55; 11, 34  
(Pam) Fiddy 2, 54  
(Graham) Field 2, 44  
(Tim) Fish 10, 12  
(Richard) Freeman 2, 24  
(Stan) Froco 9, 67; 11, 14; 12, 19  
(Gabriel) Gilson 12, 73  
(Peter) Goode 4, 62  
(John) Gordon 2, 14

(Heather) Govier 5, 27; 6, 30; 9, 45; 10, 45  
(Tony) Hallam 11, 41  
(Robert) Harding 9, 10  
(Tim) Heaton 4, 19  
(George) Hill 3, 14; 4, 46; 8, 83; 9, 83; 10, 83; 11, 83  
(C. J.) Hollyman 6, 51; 7, 60  
(Andy) Hopper 2, 41  
(A.) Kiernan 11, 43  
(Paul) McGee 6, 33; 7, 29; 8, 45; 11, 45  
(Jim) McGregor 8, 19; 9, 19; 10, 35; 11, 27, 89; 12, 31  
(B.) Mitchell 9, 11  
(Michael) Murray 4, 32  
(Robin) Norman 4, 26  
(Bill) Penfold 11, 10  
(Richard) Phillips 12, 49  
(Barry) Pickles 8, 71; 11, 57; 12, 69  
(John) Radcliffe 7, 9  
(R. C.) Rand 1, 24  
(Brian) Reffin Smith 2, 27  
(Mrs Ronnie) Rowsell 3, 61; 4, 76  
(Tony) Shaw 1, 16; 2, 49; 4, 12; 5, 11; 6, 11; 7, 11; 8, 41; 9, 35, 55; 11, 34  
(Hugh) Simpson-Wells 11, 43  
(A.) Snell 5, 61  
(Laurence) van Someren 3, 44  
(Tricia) Strong 11, 45  
(Joe) Telford 1, 25, 32; 2, 31; 3, 31; 4, 35, 60; 5, 21; 6, 6, 19; 7, 19; 8, 27, 33, 39; 10, 16, 27; 11, 18; 12, 22  
(Lyndon) Thomas 1, 7  
(David) Tilston 10, 57  
(S.) Todd 11, 56  
(Ruth) Townsend 8, 45  
(Robin) Tracy 5, 56  
(Philip) Tubb 7, 49  
(John) Turnbull 2, 13  
(Thomas) Vincent 12, 57  
(Peter) Voke 10, 19  
(Robert) Ward 12, 49  
(Alan) Watt 8, 19; 9, 19; 10, 35; 11, 27, 89; 12, 31  
(Jane) Whitwell 4, 29  
auto repeat of keys 1, 26

backups of files 12, 49  
BBC Basic II 10, 11; 11, 90; 12, 47  
BCPL programming 9, 67, 71-2  
Beale's treasure cipher 6, 46-7  
beeps 6, 6  
benchmark timings 7, 46; 8, 3; 9, 32  
biofeedback 3, 44-6  
bit-pair arrangement 10, 24  
blind students 12, 57, 59  
Bliss symbolic language 7, 20  
block graphics 5, 55; 8, 86; 11, 85  
Braille keyboards 12, 57, 59  
BREAK key 4, 16-17  
British Telecom Gold 3, 21-2  
bubble sorting 11, 14  
Buggy 8, 4, 8, 9  
business applications 2, 13-16  
busses 5, 11; 7, 39; 9, 62  
buzz 2, 60; 4, 62  
byte packing 5, 16; 8, 15-16

CALL 5, 14; 9, 35, 37  
cartridge ROM socket 1, 14; 6, 59  
cassette filing bug fix 2, 61; 9, 59  
cassette recorders

connections 1, 14; 9, 90  
tapes 12, 99  
types 3, 58; 6, 57

Ceefax 2, 10-11  
chess games 1, 20; 7, 54; 8, 75  
see also INDEX OF REVIEWS

cipher-cracking 6, 46-7  
circle-drawing 1, 7, 26  
CLEAR commands 9, 43; 10, 43  
colour combinations 4, 30-1  
colours 1, 7-8, 25; 5, 24-6; 10, 19, 22-4

on Atom 3, 41-2  
on model A 5, 53-5; 10, 19

Commodore printer 6, 37-8, 41-3  
computer literacy 7, 9  
computer-aided design (CAD) 11, 27, 29, 31  
control by computer 1, 35  
crime prevention 4, 68, 70  
crime using computers 3, 49-50  
CTRL-keys 7, 19; 10, 83-5

daisy-wheel printers 8, 83  
\*DEBUG command 12, 95  
debugging, Atom 7, 47-8  
decay rates of sound 2, 34  
decimal codes 1, 27; 4, 14  
decrement instructions 5, 14  
delay subroutines 6, 13  
Dialcom 3, 21-2  
Diary of a Computer Widow 3, 61; 4, 76-7  
digital-to-analogue conversion 8, 67, 69; 10, 53  
disc interfaces 3, 58; 5, 74, 76; 6, 19  
disc systems 1, 30; 7, 62  
disc-to-tape transfer 9, 90  
display control characters 2, 45; 5, 55  
DOS commands 1, 30; 6, 19-20, 23  
dot-matrix printers 8, 83-4, 86-7  
dumping of graphics 3, 14-15; 4, 46; 11, 87  
dynamic procedures 7, 19-22, 26

Econet 1, 14, 36-7  
editing 1, 25  
editing text 5, 47; 12, 69  
Election book 11, 10  
electronic mail 3, 20-2  
Eliza program 8, 75  
ENVELOPE commands 2, 33-4; 3, 31-2; 8, 22-4  
EPROMs described 10, 90  
Epson printers 3, 14-17; 4, 46  
error trapping 1, 25-6; 4, 16  
escape-key disablement 9, 42; 11, 43; 12, 51  
\*EXEC commands 2, 36-7; 5, 21  
expansion sockets 2, 60

fast programs 4, 35, 37  
fingerprints 4, 68, 70  
FOR...NEXT loops 4, 35, 37; 5, 12

formatting of discs 6, 22  
fraud using computers 3, 49-50  
function keys 1, 26

\*FX commands 7, 19; 10, 14, 83-85; 11, 23; 12, 51

games 1, 19-22  
see also INDEX OF PROGRAMS

and INDEX OF REVIEWS  
garbage collection 3, 24-5  
GCOL statements 1, 7-8, 24-5; 10, 24; 11, 29  
glitches 11, 65, 67  
global variables passing 5, 17  
graph plotter 8, 84  
graphics  
Atom 4, 51-5; 7, 49-50  
multi-screen 4, 62-3  
procedures 11, 18-19, 23-4, 53  
also see INDEX OF PROGRAMS  
and INDEX OF REVIEWS  
graphs display 2, 59, 63  
grass-fire techniques 1, 7-8

hash functions 11, 43; 12, 19-20  
heating-up 4, 65  
hex codes 4, 14  
high-resolution graphics 1, 26  
Hushlak (computer artist) 2, 28-9

increment instructions 5, 14  
indexed addressing 7, 16; 8, 42  
indirect addressing 8, 42  
information technology 11, 45-6, 48, 49  
ink-jet printers 8, 84  
intelligent machines 8, 75  
interactive graphics 11, 27-9, 31-2  
interfacing 1, 35; 4, 6; 7, 37, 39-40, 61; 9, 8, 62-4; 10, 53-5, 64; 11, 65, 67, 69, 71  
interrupts 11, 34-5, 37, 39, 62-3  
inversion of screen (Atom) 12, 71

keyboards 9, 75, 79  
for blind 12, 57, 59  
numeric entry 12, 61, 63-5  
'kite-flying' fraud 3, 49

language teaching 10, 45-9, 51  
legibility of programs 11, 41  
lightpens 8, 27, 29-31; 9, 8; 10, 16  
line feeds 7, 26  
line fitting 2, 59, 63  
line formats 5, 21  
linking computers 4, 64; 11, 53; 12, 95  
logical operators 12, 22-34, 25, 27-8  
Logo programming language 5, 27, 9, 48-9  
lost programs recovery 5, 17, 19; 10, 42; 11, 57  
loudspeakers 3, 57; 12, 82

machine code  
graphics 1, 16-17; 2, 49-50  
space for 7, 11; 9, 55

Making the Most of the Micro 1, 10-11; 4, 10-11; 5, 8-9; 6, 8-9; 7, 9; 8, 8-9

medical uses 3, 44-6; 7, 8; 8, 3; 12, 8

memory alteration 7, 21  
memory of Atom 6, 54  
memory map of screen 4, 13  
memory-mapped input/output 7, 37, 39-40, 61; 9, 62-4

memory maps 7, 11-12, 15, 24, 43  
memory saving 5, 16; 6, 19; 7, 24-5

MEP 6, 4

merging of colours 10, 24

mode 7 graphics 2, 44-6

models A & B compared 1, 13  
modems 3, 21  
modes demo 1, 25  
modes parameters 4, 51  
movement in graphics 1, 27; 3, 32-5; 4, 37-8  
*MPs' Chart* 11, 10  
multiple program storage 4, 32-3; 7, 26  
multiple screen display 4, 62-3  
music 2, 31-4; 3, 31-2; 5, 22, 24-5; 8, 19, 22-4; 9, 19-20, 22, 24; 10, 35-9  
also see INDEX OF PROGRAMS and INDEX OF REVIEWS  
myoelectric feedback 3, 45-6  
National Extension College 2, 24-5; 8, 6, 9  
networks 1, 36-7; 2, 60; 6, 3; 7, 62; also see Econet  
no-room avoidance 7, 24  
*OPENUP* 10, 11; 11, 90; 12, 47  
OSBYTE memory calls 7, 40  
parallel data transfer 9, 83, 86  
Pascal ROM 4, 65  
Pet printer 6, 37-8, 41-3  
phantom head 7, 8  
photography 8, 92  
PHROMs 3, 27-9  
piano keyboard 2, 32-3  
piracy of software 10, 75-6  
pitch envelopes 3, 31-2; 5, 61; 8, 22-3; 10, 62  
power supplies 2, 60; 4, 62  
Prestel 3, 21; 9, 8; 10, 89  
PRINT command 5, 76  
printers 1, 14; 3, 14-17, 36-8, 62; 4, 46; 6, 37-8, 41-3; 8, 83-4, 86-7; 9, 83-6; 10, 83-6; 11, 83-5, 87  
probability tables 10, 38-40  
procedures 5, 19, 32-3, 36, 76; 12, 44-5  
program generators 5, 22, 24  
programming in schools 4, 29-30, 66; 9, 45-9  
Prolog programming language 9, 49  
queueing 9, 19; 11, 89  
radar interference 9, 89; 11, 90; 12, 99  
recursion 10, 30-2; 12, 31, 33, 35-6, 54-5  
referral service 3, 12; 7, 9  
registers 5, 11-12  
Relaxometer 3, 44-6  
salami fraud technique 3, 49-50  
scales (musical) 10, 37  
screen display 1, 25, 38  
screen saved on tape 11, 41  
second keyboards 12, 61, 63-5, 67  
security techniques 6, 27; 8, 15; 11, 41, 59; 12, 69  
Senster sculpture 2, 27-8  
sequential files 2, 16  
serial data transfer 9, 84, 86  
Shell sort technique 5, 56; 11, 14  
shortening program lengths 6, 25-6; 10, 43; 12, 69  
shuddering TVs 7, 60; 9, 89; 11, 23  
Sierpinski curves 12, 36, 54

Sinclair ZX printer 3, 36-8, 62; 5, 46-8  
software library 7, 32  
sorting 5, 56-7, 59; 11, 14  
sound 1, 32-3; 2, 31-4; 3, 31-2  
Atom 10, 57-9, 62, 64; 12, 71, 73, 75  
visualisation 5, 61-2, 64; 8, 19, 22-3  
spastics helped by computers 3, 45-6  
speech synthesisers 3, 27-9; 9, 6; 12, 57  
\*SPOOL commands 2, 36-7; 5, 21-2  
state space diagrams 12, 55  
stock control 2, 15-16  
string errors 4, 64; 5, 74  
string handling 3, 24-5; 11, 59; 12, 39  
subroutines 5, 32-3, 36; 6, 13-14  
synchronisation 9, 19-20; 11, 89  
synthesisers (musical) 4, 66  
TAB key 7, 19  
tape format 5, 76  
tape storage 4, 32-3  
Technology Centres 1, 37  
telesoftware 2, 10-11, 62  
teletext adaptors 1, 14, 38; 2, 62; 4, 4; 10, 89  
teletext graphics 2, 44-6  
television series 1, 10-11; 3, 11-12; 4, 10-11; 5, 8-9; 6, 8-9; 7, 8-9; 8, 8-9  
testcards for printers 3, 14-15  
text variations 4, 56-7  
*The Computer Programme* 1, 10-11; 3, 11-12; 7, 8-9; 9, 5  
*30-Hour Basic* 2, 24-5  
tree-searches 7, 54; 12, 33, 35  
triangle fill facility 1, 7  
Trojan Horse technique 3, 50  
truth tables 12, 23, 25, 27-8  
TTL monitors 3, 41-2  
tunes conversion 2, 32-3; 9, 20  
Turing test 8, 75  
Turk chessplayer 8, 75  
turtle graphics 5, 27, 29-31; 9, 48  
two-pass assemblies 6, 11, 13  
typewriter keyboards 9, 75, 79  
UFO characters 3, 32-3  
ULA design 2, 41-2  
upgrading model A 1, 13  
*User Guide* 2, 11; 8, 92  
user-defined graphics 1, 27; 3, 32; 4, 37-8  
USR functions 5, 14  
VDU commands 1, 7; 7, 19; 10, 43, 84-5  
verify utilities 2, 37  
VIA chip 8, 39, 67, 91; 9, 62  
video digitised images 9, 5, 43, 53  
video interference 6, 61; 9, 90; 11, 57, 90  
vidiots 4, 66  
voice ROM 3, 27-9; 9, 6; 11, 5  
Votrax Type 'N' Talk speech synthesiser 12, 57, 59  
word processing (Atom) 5, 46-8; 12, 69, 71  
also see INDEX OF REVIEWS  
Z-X printer 3, 36-8, 62; 5, 46-8

## PROGRAM LISTINGS

[assembly language program indicated by (asm.)]

"A" on screen (asm.) 4, 13-14, 78  
"A-Z" to printer 10, 84-5  
ADC checks 11, 69  
addition 2, 13  
address 9, 46  
addressing modes 5, 12; 7, 15-16; 8, 41-3  
ADVAL demo 11, 89  
advertising board 4, 44  
*Air Attack* game 12, 75  
alarm 5, 35  
alien 1, 26  
Amber printer 7, 58; 10, 90  
animated train 4, 55  
array variables 12, 44-5, 51  
*As with Gladness, Men of Old* 5, 25  
ASCII disassembler 11, 57  
Atom-to-Beeb 6, 53; 7, 60  
auto-destruct 9, 42; 10, 90  
BBC-to-BBC communication 11, 53  
BBC-to-Z8 communication 11, 53  
BBCWRITE 6, 53; 7, 60  
benchtests 9, 30-1  
binary recursion 12, 33  
binary values (asm.) 9, 36  
bleep generator 12, 73  
block move 8, 71  
*Bomber* game 4, 40-2  
boxes 11, 23  
BREAK key 4, 17  
BRK handling (asm.) 11, 62  
bubble sorting 11, 16  
byte packing 5, 16; 8, 16  
CALL machine-code routines 5, 14; 9, 35  
canons (musical) 9, 22, 24  
caps-lock control 8, 16  
carols 5, 25; 12, 73  
catherine wheel 4, 60-1  
CB1 interrupts 11, 39  
CB radio 11, 24  
CFS patch 2, 61; 3, 4; 9, 59  
chaos 10, 35  
Christmas card 5, 26  
chromatic octave 2, 31  
circles 1, 7, 26; 11, 24  
CLEAR 9, 42-3  
clicks 12, 75  
colourburst 5, 26  
colours  
background 5, 53  
experiment 5, 26  
flashing 4, 43; 5, 54  
foreground background & text 1, 25; 3, 57  
graphics foreground 5, 54  
mixtures 10, 19, 22-3  
steady 5, 54  
zig-zag 1, 16-7  
Commodore printer 6, 37-8, 43  
continuous tone 10, 59  
control characters 10, 85  
crab canon 9, 24  
crossed loops 4, 35  
DAC checks 11, 69

date 12, 22  
delay procedures 5, 21; 6, 13; 10, 31  
disabling IRQ interrupts 11, 37  
disc pack (Atom) 2, 37  
disc shift 6, 19; 7, 24-5; 10, 27; 11, 43; 12, 47  
display text file (asm.) 8, 43  
dog drawing 9, 48  
double-height characters 2, 45; 4, 57; 5, 54; 10, 31  
dragging 11, 31  
drawing 4, 26; 5, 55; 9, 48  
dumb terminals 1, 24; 4, 58  
editing 6, 25; 8, 43  
ellipses 11, 24  
encode—decode 8, 16  
ENVELOPE display 5, 62, 64  
EOR operator demo 12, 28  
Epson printer dump 3, 14-16; 4, 46  
Epson test 10, 86  
Eratosthenes's sieve 9, 71  
error handling 7, 48; 11, 56  
ET phone home 9, 49  
event initiation 11, 34  
execute text command file (asm.) 8, 43  
factorials 5, 35; 10, 30  
files behaving like programs 12, 49  
files created 10, 11; 11, 90; 12, 47  
find utility (asm.) 11, 56  
fireworks 4, 60-1  
first-order tunes 10, 39-40  
"Fred" on screen 2, 45; 7, 11-12, 15; 9, 55  
frequency sweep 10, 59  
frequency tables 10, 40  
*Frere Jacques* 9, 20, 22  
function keys 4, 75  
GCOL 10, 23  
general purpose input routine 10, 32  
goggle box 11, 23  
*Good King Wenceslas* 5, 25; 12, 73  
graph line-fitting 2, 59  
graphics  
fix (Atom) 11, 57; 12, 71  
foreground colour 5, 54; 8, 92  
machine code 1, 16-17; 2, 49-50; 4, 52-5  
rotation 7, 49-51  
on ZX printer 3, 37-8, 52  
windowing 4, 29; 5, 35  
grass-fire procedure 1, 8  
gunshot 10, 59  
hash table 12, 19  
heavy metal music 12, 75  
hello goodbye 4, 30  
*Hexangle* game 9, 12-13, 15-16  
home cursor (asm.) 1, 16  
house building 11, 23  
increment instructions 5, 12  
indexed addressing 7, 15-16  
indirect addressing 8, 41-3  
INKEY (Atom) 11, 59  
interface tests 11, 67-69  
interrupts 8, 69; 11, 34, 37, 39  
IRQ1 vectors change 11, 39

jazz 10, 40  
 jump indirect instruction (asm.) 8, 41  
 keyboard bounce 12, 63  
 keyboard debounce (Atom) 12, 71  
 labels printing 2, 15  
 lightpen 8, 29-31, 33-4, 39-40; 10, 16  
 line drawing 5, 55; 11, 28  
 line fitting 2, 59, 63  
 line spacing, printer 10, 86  
 line spacing, screen 11, 43  
 Lissajou figures 10, 12  
 loading from RS423 1, 24  
 loopy graphics 10, 12  
 lower-case characters (asm.) 8, 42  
 machine code  
     binary routine 9, 36  
     graphics 1, 16-17; 2, 49-50; 4, 52-5  
     parameter block after CALL 9, 35  
     registers changed 5, 14  
     retrieval 10, 42  
     routines CALLED 5, 14  
     square routine 9, 38  
     USR passing register values 5, 14  
 mailing list 2, 14-15  
 mainframe terminal 1, 24  
 matrix multiply 12, 45, 51  
 maximum value 5, 35  
 memory alteration 7, 21  
 mémory saving 7, 24-5  
 micro blues 10, 40  
 mirror canon 9, 24  
 mode 7  
     background 1, 25; 3, 57; 5, 54; 8, 92; 10, 31  
     graphics character set 2, 45  
 mode changing 10, 43  
 monotony 10, 35  
 Mother's Day 9, 11  
 multi-choice quiz (lightpen) 8, 39-40  
 multiple programs 4, 33; 7, 26  
 multiple screens 4, 63  
 multiple statement listing option 11, 41  
 music 5, 22; 8, 22-4; 9, 20, 22, 24, 10, 35-6, 39-40; 11, 89  
 music (Atom) 12, 73, 75  
 New York 10, 22  
 NOT operator demo 12, 8  
 octave 2, 31  
 Olivetti ink-jet dump 11, 87  
 Olivetti TAB function 10, 86  
 OR operators demo 12, 25  
 organ music 2, 33  
 OXO game (lightpen) 8, 33-4  
 'paint-an-adder' 2, 53  
 pair reading 5, 16  
 password 8, 15; 11, 41  
 Pet printer 6, 37-8, 43  
 piano 8, 22  
 picking 11, 31  
 picture DATA procedure 4, 26  
 picture dump 3, 14-16  
 PLOT 85 8, 71  
 plotting squares 2, 46  
 point plotting 5, 54; 8, 16  
 Pretty1 1, 27  
 printer byte build-up 11, 87  
 printing  
     'A' to 'Z' 10, 84-5  
     letters on same line 10, 83  
     letters on separate line 10, 83  
     positive integers 12, 31  
     text in graphics modes 12, 71  
 prison bars 5, 25  
 PROC calls 10, 32  
 procedure error 11, 43  
 protection 6, 27; 8, 15; 11, 59; 12, 69  
 pulse generator 8, 69  
 quiz (using lightpen) 8, 39-40  
 random pattern generator 10, 22  
 random stroll 10, 35  
 range check 12, 22  
 recovery of lost programmes 5, 19; 10, 42; 11, 57  
 rectangle drawing 11, 18  
 recursion 10, 30; 12, 31, 33, 36, 54-5  
 red alert 1, 32  
 registers (asm.) 5, 12  
 relocation 6, 19; 7, 24-5; 10, 27; 11, 43; 12, 47  
 REPEAT . . . UNTIL check 12, 22  
 rhythm with random notes 10, 38  
 rhythmic effects 8, 24  
 rock music 12, 75  
 rocket motor noise 12, 75  
 ROM copied into RAM 8, 71  
 rose bouquet 9, 11  
 rotation 11, 32  
 rotation 7, 49-51  
 rounds (musical) 2, 34; 9, 20, 22  
 RS423 loading 1, 24  
 rubberband 11, 28  
 Russian 9, 11  
 scalar product 12, 44  
 scampering character 4, 38  
 screen messages avoidance 11, 87  
 second keyboard 12, 64-5  
 Seikosha printer dump 3, 17; 11, 87  
 sieve of Erastothenes 9, 71  
 self-destruct 9, 42; 10, 90  
 self-erasing 6, 25, 27  
 seven-tone testcard 4, 46  
 shape definition 1, 26  
 shape erasing 1, 8  
 Shell sorting 5, 57, 59; 11, 16  
 shift 7, 24-5; 11, 43  
 shift-lock control 8, 16  
 shrinking screen in mode-6 11, 43  
 Sierpinski curves 12, 54  
 Sinclair ZX printer 3, 37-8, 52; 5, 46-8  
 sirens 1, 32  
 snake drawing 2, 53  
 son of Wordpack 12, 69  
 sorting 5, 57, 59; 11, 16  
 sound on Atom 10, 59  
 SOUND display 5, 62, 64  
 space bar procedures 5, 21; 10, 31  
 space bug 3, 35  
 space filler 3, 24  
 squares 2, 46; 4, 30; 11, 32; 12, 36  
 squares (machine code) 9, 36  
 standard octave 2, 31  
 Star Trek red alert 1, 32  
 stars 1, 27  
 Stars & Stripes 9, 10  
 stock control 2, 16  
 stock recording 2, 16  
 string handling 3, 24-5; (asm.) 11, 56  
 stripes 10, 23  
 subroutines demo 6, 14, 16  
 sunset 3, 52  
 syntax-generated rhythm 10, 36  
 TAB function 10, 86  
 tape-to-disc transfer 9, 42  
 teaching timetable 4, 37  
 teletext 2, 45  
 temporary memory location 10, 11  
 terminals 1, 24; 4, 58; 11, 53  
 testcards 3, 15; 4, 46  
 text  
     colours 1, 25; 3, 57; 5, 54; 8, 92; 10, 31  
     variations 4, 57; 5, 54; 6, 58; 8, 42-3; 10, 31  
     windowing 4, 29  
*The Musical One* 5, 22  
 three-tone testcard 3, 15  
 three-voice round 9, 22  
 throbbing colours 4, 43  
 times tables 9, 47  
 timetable initialisation 4, 37  
 timing 4, 35; 12, 97  
 TMO 5, 22  
 Towers of Hanoi 5, 35; 12, 36, 55  
 trace (asm.) 11, 63  
 train graphics 4, 55  
 train noises 1, 32  
*Trek III* 4, 20, 22-4; 6, 60  
 triangles 4, 26, 30; 8, 71; 11, 18  
 triangular patterns 1, 27; 11, 18-19  
 tunes conversion 2, 32  
 tunes from DATA 5, 22; 8, 23  
 two-pass (asm.) 6, 11  
 two-voice round 2, 34  
 typewriter 6, 16  
 UFO 3, 33-4  
 user-defined characters 4, 57  
 USR passing register values 5, 14  
 utilities 2, 37; 11, 56; 12, 44-5, 51  
 varying tone 10, 59  
 VDU 23 8, 72  
 verify utility 2, 37  
 windowing 4, 29; 5, 35  
 wire-frame graphics 7, 49-51  
 word processing 5, 46-8; 12, 69  
 ZDRAVSTVYEE 9, 11  
 zeroes removed 12, 71  
 zig-zag in colour 1, 16-7  
 ZX printer 3, 37-8; 5, 46-8

**PRODUCT REVIEWS**

AB Designs Drawing Program 11, 77-8, 81  
*Add-Tabs* software 5, 43  
 Adventure games 9, 59  
*Alphabeta* software 5, 42  
 Amber 2400 printer 7, 58  
*Animal* educational program 6, 35; 9, 51, 54  
*Assembly language programming for the BBC micro* 8, 79; 10, 89  
*Astrobirds* game 9, 58

ATPL Autoprommer 12, 85-6  
 authors of reviews  
     (Charles) Baker 9, 51  
     (Paul) Barbour 5, 41-2  
     (Jeremy) Bennett 8, 80  
     (Paul) Beverley 2, 19; 8, 58; 10, 11; 11, 73  
     (C.M.) 8, 58  
     (Simon) Dally 3, 54; 9, 79; 10, 71  
     (John) Ferguson 8, 79; 10, 89  
     (Vincent) Fojut 12, 85  
     (Philip) Garrett 5, 40; 8, 57, 58  
     (Heather) Govier 8, 53; 9, 53  
     (Malcolm) Hall 3, 53  
     (George) Hill 7, 58; 10, 67; 12, 77  
     (Paul) McGee 12, 88  
     (Jason) Mallen 5, 43  
     (Jacquetta) Megarry 7, 56  
     (Mike) Milne 11, 77  
     (Barry) Pickles 5, 50; 7, 43; 9, 57; 12, 83  
     (Tony) Pierce 8, 51  
     (Alan) Piper 5, 42; 8, 57  
     (Tony) Quinn 7, 57; 10, 71  
     (Mike) Sharp 5, 45  
     (Tony) Shaw 8, 79; 10, 89  
     (Bruce) Smith 8, 64  
     (Barbara) Tarrant 8, 51  
     (Joe) Telford 9, 27  
     (John) Vaux 5, 38-40; 8, 11  
     (Alan) Watt 8, 80

*Basic Programming on the BBC Microcomputer* 3, 53  
 BBC Basic board 2, 38; 7, 43-4, 46  
 BBC Basic II ROM 10, 11  
 BBC keyboard 3, 58; 9, 79  
*BBC Microcomputer System User Guide* 3, 53-4; 8, 92  
 BBC model A 2, 19-22  
*Beach Balls* graphics program 1, 6  
*BIGAL* educational program 2, 45-6  
*Billiards* game 8, 57  
*Boat* educational program 8, 47  
 book authors  
     (Roy) Atherton 12, 88, 89  
     (P.) Ayre 12, 88  
     (D.) Ball 12, 88  
     (Ian) Birnbaum 8, 79; 10, 89  
     (A.) Bork 12, 88  
     (Peter) Brown 8, 79-80  
     (David) Chandler 8, 53  
     (John) Coll 3, 53  
     (John) Councie 1, 6  
     (Neil & Pat) Cryer 3, 53  
     (Derek) Daines 8, 56  
     (Richard) Dawkins 11, 13; 12, 15  
     (Eric) Deeson 2, 4; 5, 45  
     (Frank) George 10, 71  
     (C. M.) Gillmore 12, 88  
     (Robert) Harding 8, 79  
     (Tim) Hartnell 3, 53  
     (J. A. M.) Howe 12, 88  
     Hutchison 12, 88  
     (Henry) Ledgard 10, 71; 12, 88  
     (R.) Lewis 12, 88  
     (Alan) Maddison 12, 88, 89  
     (A.) Nash 12, 88  
     Payne 12, 88  
     (Clive) Prigmore 12, 88  
     (P. M.) Ross 12, 88  
     (Andrew) Singer 10, 71; 12, 88  
     (P. R.) Smith 12, 88  
     (R. A.) Sparkes 12, 88  
     (Gordon) Welchmann 3, 54

book publishers  
 Acornsoft 1, 6; 8, 80  
 Addison-Wesley 8, 79  
 Allen Lane 3, 54  
 AVC Software 2, 4; 5, 45  
 BBC 3, 53  
 Collins 12, 88  
 Coronet Books 10, 71  
 Fontana 12, 88  
 Heinemann Educational 12, 88  
 Hodder & Stoughton 12, 88  
 Hutchison 12, 88  
 Interface 8, 53  
 Kogan Page 12, 88  
 Longman 12, 88  
 McGraw-Hill 12, 88  
 Macmillan 8, 79; 10, 89  
 MEP 8, 53, 56  
 Oxford University Press 11, 13; 12, 15  
 Pergamon Press 12, 88  
 Pitman 12, 88  
 Prentice Hall 3, 53  
 Breakout game 5, 41  
 Brickup educational program 4, 9  
 Bridgeman game 5, 38; 7, 3  
 CAL in Physics Education 12, 89  
 CAL – Scope, Progress and Limits 12, 88  
 CAL 81 Symposium 12, 88-9  
 chess games 5, 39-40; 8, 11-13  
 code-breaking 3, 54  
 Colossal Adventure game 5, 40  
 Computer Software for Schools 12, 89  
 Crash educational game 9, 53; 4, 9  
 Creative Graphics on the BBC Microcomputer 1, 6  
 Cumana disc drives 9, 27, 30-2  
 Death Satellite game 9, 59  
 Defender game 1, 22; 3, 8  
 Diet educational program 9, 54  
 Disassembler software 8, 57  
 Disatomp utility ROM 12, 83  
 disc drives 1, 30; 9, 27, 30-2  
 Dodgems game 5, 41  
 Drawing graphics software 2, 29; 8, 58  
 Dungeons game 9, 59  
 ECFG program 11, 78  
 EDG Graphics Package 11, 77-8, 81  
 Eldorado Gold game 8, 57  
 Elementary Basic 10, 71; 12, 89  
 Elephant educational game 8, 46  
 EPROM programmer 12, 85-6  
 Ergo educational program 8, 46  
 Eureka educational program 8, 48  
 Explore game 9, 51  
 Farmer educational program 8, 47; 9, 54  
 Flash game 5, 41  
 Footer game 8, 58  
 Galaxy game 5, 41  
 Gomoku game 5, 41  
 Graphs and Charts on the BBC Microcomputer 8, 79  
 Great Britain Ltd game 5, 40-1  
 Horse Race Forecast program 10, 71  
 House game 9, 59  
 IBM PC keyboard 9, 79  
 Intergalactic game 9, 59  
 Introduction to Microcomputers 12, 89  
 Jane educational program 8, 46-7  
 Jugs educational program 6, 35; 8, 47  
 Kaleidoscope graphics program 1, 6  
 Learning with the Beeb 2, 4; 5, 45  
 Let your BBC Micro teach you to program 3, 53  
 Litter educational game 9, 54  
 Logo Challenge 5, 29-31; 8, 47  
 Lunar Lander game 8, 58  
 Masterbrain game 5, 41  
 Maze program 8, 51  
 Microcomputers in the Classroom 12, 89  
 Microcomputers in Science Teaching 12, 89  
 Microcomputers in Secondary Education 12, 88  
 Microprimer 8, 53, 56; 9, 53-4  
 Microvoc loudspeakers 12, 82  
 Microwriter keyboard 9, 79  
 Missing Signs educational software 9, 58  
 Monsters game 1, 22; 3, 8; 11, 90  
 MQuiz educational software 9, 54  
 Mul-Tabs software 5, 43  
 Munchyman game 5, 38-9  
 Muproc music synthesiser 12, 79, 82  
 Number Balance educational software 9, 58  
 Olivetti JP101 dry ink-jet printer 10, 67, 69  
 Omega Mission game 9, 57-8  
 Painter game 9, 58  
 Painting graphics software 2, 29; 8, 58  
 Pascal from Basic 8, 79-80  
 Persian Carpet graphics program 1, 6  
 Pirates educational program 2, 44  
 printers 7, 58; 10, 67, 69; 12, 77, 79  
 Process educational program 11, 49, 51  
 Proctest educational program 11, 51  
 Programmer's Toolbox EPROM 5, 50-1, 72, 74  
 programming books 3, 53  
 Programs 1 & 2 8, 58  
 programs, books 5, 45  
 Quiz educational software 9, 54; 10, 46  
 Rainbow graphics program 1, 6  
 Reversi game 5, 41; 8, 57  
 Rocket Raid game 7, 57  
 Ross utility EPROM 8, 64  
 Sculpture graphics program 8, 58  
 Search educational database software 11, 51  
 Seikosha GP100A printer 12, 77, 79  
 Sentence Sequencing educational software 9, 58  
 Sherlock Holmes book 10, 71; 12, 89  
 Shopping educational program 8, 47; 9, 53  
 Snake game 5, 42  
 Snap educational program 8, 51  
 Snapper game 1, 21; 3, 8; 5, 39, 74  
 Snooker game 8, 46; 9, 58  
 software suppliers  
 A & F Software 5, 51; 8, 80; 9, 59; 12, 83  
 AB Designs 11, 77  
 Acornsoft 1, 6, 21-2; 5, 39, 74; 9, 58; 10, 71  
 Addison-Wesley 5, 29; 8, 48  
 BBC Publications 2, 29; 8, 58  
 BBC Soft 5, 41-3; 8, 58  
 Bridge Software 5, 38; 7, 3  
 Bug-Byte 8, 11-13  
 Computer Concepts 7, 57; 8, 11-13  
 Cottage Software 5, 43  
 Davidson Centre 8, 48  
 Gaelsett Software 11, 78  
 H & H Software 5, 42; 8, 57  
 (Simon W.) Hessel 5, 40-1  
 Hopesoft 9, 58-9  
 ITMA 2, 46  
 Level 9 Computing 5, 40  
 Longmans Micro Software 8, 48  
 MEP 8, 56; 9, 51, 53-4; 4, 9  
 Micro-Power Ltd 5, 51, 72; 9, 58  
 Micromania 9, 57-8  
 NECOPS 8, 48  
 Newman College 8, 48, 51  
 Procyon 12, 83  
 Program Power 5, 38-40; 8, 11-13, 57; 9, 59  
 Quicksilva 12, 79, 82  
 Ross Software 8, 64  
 Salamander Software 11, 77  
 Shell Centre 8, 48  
 SMILE 8, 48, 51  
 Sporting Forecasts 10, 71  
 Watford Electronics 12, 83  
 Spectrum micro 2, 19-22; 9, 79  
 Spiro educational program 8, 48  
 Starship Command game 10, 71  
 Structured Programming with BBC Basic 12, 89  
 Subgame educational program 8, 46  
 Takehalf educational program 8, 48  
 Tess graphics software 8, 57  
 The Hut Six Story: Breaking the Enigma Codes 3, 54  
 The Selfish Gene 11, 12, 13; 12, 15  
 30-Hour Basic—school edition 12, 89  
 toolkit EPROMs 5, 50-1; 8, 64; 12, 83  
 Tower educational program 8, 51  
 Trains educational software 8, 46  
 Tray educational program 10, 46-9, 51; 11, 51  
 Trees graphics program 8, 58  
 User Guide 3, 53-4; 8, 92  
 Utilikit EPROM 5, 51; 12, 83  
 View word-processing chip 11, 73, 75, 81  
 Werom utility ROM 12, 83  
 Windy Field graphics program 1, 6  
 Word Hunt educational software 9, 58  
 word processing 5, 42; 7, 56-7; 11, 73, 75, 81  
 Word Sequencing educational software 9, 58  
 Wordwise chip 7, 56-7; 11, 73, 75, 81  
 Wordworm educational program 2, 46  
 Yellow River Kingdom educational program 4, 8-9  
 Zodiac game 9, 59

## COMPETITIONS & PUZZLES

balloon 8, 4  
 banknote 3, 50  
 bullies 11, 23; 12, 14-15  
 calendar 9, 79  
 card dealing 1, 22; 3, 52  
 code breaking 2, 56; 3, 57; 4, 70; 6, 46-7; 10, 75  
 dice-throwing 1, 22; 3, 52  
 eleven-divisible numbers 10, 78  
 evolutionarily stable society 11, 12-13; 12, 14-15, 20  
 Farmer Giles 5, 79; 9, 75  
 FNSQ(X) 3, 8  
 forgery 3, 50  
 graphics 3, 50  
 Gregorian calendar 9, 79  
 grin 8, 4; 10, 8  
 half-numbers 5, 79; 9, 75  
 hawk—dove society 11, 12-13; 12, 14-15, 20  
 hidden message 8, 6; 10, 8  
 King and Knight 9, 79  
 mileage 7, 54-5; 11, 13  
 nine-digit number 4, 71; 7, 55  
 numbers 5, 78-9; 9, 75  
 perfect numbers 5, 79; 9, 75  
 perfect squares 9, 79  
 ply of numbers 5, 79; 9, 75  
 prime numbers 10, 78  
 prober-retaliators 12, 14-15  
 puzzle editor 4, 71; 7, 55  
 raffle tickets 8, 75; 12, 20  
 retaliators 12, 14-15  
 reversible numbers 5, 78-9; 9, 75  
 Risk game 1, 22; 3, 52  
 salesman 7, 54-5; 11, 13  
 seven-digit number 10, 78  
 ten-digit square 5, 79; 9, 75  
 'Towers of Hanoi' 5, 33; 12, 35, 54  
 travelling salesman 7, 54-5; 11, 13  
 Tron 4, 3; 5, 67-8